

**THE PECULIARITIES OF THE FACTOR STRUCTURE
OF TEACHERS' PROFESSIONALISM REALIZED
IN UKRAINIAN EDUCATIONAL SYSTEM**

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INTRODUCTION

In the context of modernization of Ukrainian educational system, developing due to the provisions of the 'New Ukrainian School Concept', there is increasing contradictions between current requirements in the field of education of the young generation and its preparedness for living in new social conditions, revealing teachers' insufficient readiness for working in educational field. Complex socio-political processes taking place in our society have affected the youth, its views, attitudes, relationships and beliefs. The underestimation of the role of student's personality development as well as the scientific knowledge in the organization of educational process has already led to serious shortcomings in educational process and considerably reduced the pedagogical impact on a significant number of young people. These problems are due to some negative phenomena in the youth environment stemming from some socio-economic and cultural factors. One of these is connected with the alienation of a young person from national cultural roots. A decline in trust and respect for older generation is also taking place.

The profound qualitative changes taking place in the youth subculture are evidenced by the research conducted by such Ukrainian scholars as Yu. P. Azarov, O. O. Bodalev, I. D. Beh, A. M. Boyko, G. P. Vasyanovych, I. A. Zyazyun, V. G. Kremen and others.

At the same time, nowadays the educational process in Ukrainian pedagogical universities is characterized by focusing on the formation of a comprehensively developed personality, and its individual development presupposing the strengthening of Ukrainian national component, specifically, the expanding of students' study of national history, culture, geography (V. G. Kuz, Yu. D. Rudenko, Z. O. Sergiychuk). In this respect, democratization of school management in the form of school boards and other forms of self-management has gained a great importance.

The current category of student youth is of great scientific interest for researchers because the students are the representatives of modern

Ukrainian youth. Then, it is during adolescence that the students' worldview is shaped, revealing an increase in their cognitive interest in general principles of the Universe, in the laws of nature and human being. At the same time, young people ponder about life plans, professional orientation and self-determination. Despite young people's desire for independence, they need the help of the older generations, who transfer to young people the accumulated knowledge and life experience. However, only professionally educated teachers can support young people in their personality and professional development.

Therefore, it is a very important to outline the essence of productive educational activities of the teachers of secondary and vocational schools as well as to reveal the factors influencing the process of improvement of teachers' pedagogical skills.

The conducted studies in the mentioned field (I. D. Beh, O. S. Berezyuk, O. M. Vlasenko, A. V. Voznyuk, A. O. Derkach, L. O. Khomich, S. L. Yatsenko and others) testify to insufficient level of teachers' professional training in the sphere of educational activities. Many teachers of vocational schools are experiencing serious difficulties in their educational work. The main reason of such a situation, according to the teachers themselves, is insufficient level of their knowledge and pedagogical skills in using pertinent pedagogical methods and techniques.

At the state level, the importance of mentioned problems is expressed in the laws of Ukraine «On Education» (2017), «On Higher Education» (2017) as well as in the «Concept for the Development of Teacher Education» (2016), in the concept for implementation of state policy in the field of reforming general secondary education the «New Ukrainian School» for the period up to 2029, etc.

1. Study of the peculiarities of teachers' educational activities depending on the level of their pedagogical professionalism

The aim of the study consists in finding out an integral picture of the peculiarities of teachers' educational activities depending on the level of their pedagogical professionalism.

1) To reveal the factor structure of the parameters of the process of teachers' mastering the professional skills in the sphere of educational work;

2. To prove that the factor structures of highly-skilled and lower-skilled teachers are significantly different.

The pedagogical experiment study was conducted in Zhytomyr region, Ukraine, during the period from 2014 to 2020 when Ukraine has been undergoing crucial social and political changes. Two groups have been

selected from general totality of the teachers (68 people): highly-skilled (30 people) and low-skilled (25 people) teachers. Each of the groups was studied according to the characteristics determined by us in the process of analyzing the teachers' educational activities. These characteristics were confirmed by 46 expert pedagogues.

The methodological foundations of the study are connected with scientific concepts, philosophical, psychological and pedagogical ideas, including the ideas of human-centrism, philosophy of education and methodological provisions reflecting the essence of educational activities.

A method enabling to determine the hidden content parameters of the studied phenomenon, and reproducing with their help an integral picture of mentioned process, is factor analysis being one of the best research tools in the sphere of educational science. This is evidenced by special works on factor analysis¹. The above circumstances prompted us to resort to its use.

2. Results of the study of the characteristics of teachers' educational activities depending on the level of their pedagogical professionalism

Applying the factor analysis method required a number of procedures. First of all, it was necessary to determine the essential parameters/indicators of this process. The choice of the parameters was made due to the analysis of conducted psychological and pedagogical research in this field. The criterion for selecting the indicators stemmed from a number of scientific papers devoted to the problem under study. However, the number of variables, of course, does not cover all sides of studied phenomenon. Their numerical choice is somewhat limited by both the number of experimental samples and the tasks of the study. Therefore, such an approach cannot claim to express an exhaustive characteristic of this process, but it provides the teachers with a clear and profound understanding of the process of their professionalization.

Let us analyze these parameters.

1. The level of formation of pedagogical skills reflects the system of purposeful conscious pedagogical interactions of teachers with students in functional and pedagogical aspects. The importance of developing the concept of «skills» is confirmed by the results of many studies (K. K. Platonov, N. V. Kuzmina, A. O. Derkach, V. O. Slaktionin, Yu. K. Babansky and others).

2. The duration of pedagogical work of a teacher is also an important indicator, because it is in the process of pedagogical activities that the

¹ Harman, Harry H. (1967) *Modern Factor Analysis*. 2. Durchges. Aufl. The Univ. of Chicago Press, Chicago und London. DOI <https://doi.org/10.1002/bimj.19700120119>

pedagogical skills develop and improve in the teachers (S. L. Rubinstein, B. G. Ananiev, O. M. Leontiev, N. V. Kuzmina, M. S. Kagan and others).

3. The duration of teachers' work with student groups in connection to other indicators, by our assumption, has a significant impact on developing the teachers' pedagogical skills. The role of this factor is not sufficiently reflected in scientific literature, but the analysis of teachers' educational activities in working with the students gives us the reason to consider it to be a significant one.

4. Pedagogical skills and abilities being stable properties of teacher personality and reflecting the structure of pedagogical activities were the subject of study of many domestic scientists (B. G. Ananiev, F. N. Honobolin, Yu. O. Samarin, O. G. Kovalev, V. M. Myasishchev, N. V. Kuzmina and others).

5. Attitude to professional activities is a leading concept in relationship theory. It reflects the system of individual selective conscious relationships of the teacher's personality with different aspects of objective reality, and relates to integral indicators, including such personality qualities as a sense of obligation, responsibility, love of the teaching profession, honesty, etc. Research conducted by V. M. Myasishchev², K. K. Platonov, N. V. Kuzmina³, A. O. Derkach and others has proved the importance of this indicator for pedagogical activities.

These parameters were selected by us in the process of studying the teachers' activities in the sphere of educational process and were confirmed by 46 competent pedagogues. The set of indicators is diverse enough to analyze the process under study in a comprehensive manner.

It is known that the use of factor analysis needs compliance with a number of restrictive conditions, in particular, the conditions of linearity and normality in distribution of certain indicators⁴. The latter required special preparation of experimental data for factor studies. We wanted to make sure that the relationship between the indicators was monotonous. This condition was followed by a number of additional procedures.

Since some of the selected indicators (1, 4, 5) were measured using point estimates, it was necessary to bring them back to normal. To this end, we used the rules of bringing experimental estimates to the normal

² Myasishchev, V.N. (1995) *Psihologiya otnosheniy* [Relationship psychology] / Pod red. A.A. Bodaleva / Vstupitelnaya statya A.A. Bodaleva. M.: Izd-vo «Institut prakticheskoy psihologii», Voronezh: NPO «MODEK». 400 s. [in Russian]

³ Kuzmina, N.V. (1990) *Professionalizm lichnosti prepodavatelya i mastera proizvodstvennog oobucheniya* [Professionalism of the personality of the teacher and master of vocational training]. K.: Vyssh. shk. 119 s. [in Russian]

⁴ Harman, Harry H. (1967) *Modern Factor Analysis*. 2. Durchges. Aufl. The Univ. of Chicago Press, Chicago und London. DOI <https://doi.org/10.1002/bimj.19700120119>

distribution law developed by A.M. Meyerson. In doing so, we applied the most difficult case of normalizing estimates, being divided into a relatively small number of groups of the same score.

The essence of the method of normalization was as follows: the estimates expressed in the points are ranked in advance due to stemming from the principle of conformity with the assessment, which expresses the higher professional quality of the individual due to the rank number of a greater numerical value. In this case, each group of equal estimates was given an adequate number of contiguous ranks, and this operation was following by calculation of average normalized estimates by the formula:

$$Z_s = \frac{\bar{Z}_s + G_s}{2}$$

On this basis, Pearson correlation coefficients were calculated, which were the matrix of experimental correlation coefficients.

The initial correlation matrix contained a variety of information about the relationships between all selected indicators, reflecting the development of teachers' pedagogical professionalism in educational work with the students. The transformation of the correlation matrix into a matrix of factor weights was carried out using the principal components method.

Factoring the matrix made it possible to organize all the relationships by grouping them within several hypothetical factors. To obtain a more prominent form of the factor structure, the original matrix was rotated according to the criterion proposed by Kaiser. This allowed us to obtain the factors of approximately equal informative nature. The criteria for selecting levels of significance for the factor weights were determined on the basis of the methodology proposed by H. Harman.

A mandatory rule for factor analysis studies presupposed the selection of the groups in such a way that the factor structure could be sufficiently clear. Taking this into consideration, two approximately equal groups were selected: highly-skilled (30 people) and low-skilled (25 people) teachers. Each group included the teachers with the indicators that have their peculiar characteristics. The latter subsequently enabled to carry out a comparative analysis of the studied factor structures.

In determining the names of the factors, we were guided by the values of factor weight. The chosen name usually corresponded to the nature of the parameters having the highest correlation coefficients with a concrete factor.

Content interpretation of the factors

As a result of the factoring of five initial indicators, three factors were identified with an overall informative content of 78% in the group of highly-skilled teachers, and 77% in the group of low-skilled teachers.

Let us consider the results of factorizing the correlation matrix obtained in group I after rotation. The first factor, with informative content

of 29.5%, combines two indicators that characterize the level of pedagogical skills (indicator 1) and the pedagogical abilities (indicator 4) being formed. Both indicators have fairly large factor weights of 0.85 and 0.83, respectively, and are characterized by the highest loading of the first factor. The analysis of factor weights enables to interpret this factor as a skill, being a content characteristic of pedagogical professionalism. The presence of high pedagogical abilities allows the teacher to develop pedagogical skills in the sphere of educational work much faster. This is facilitated by the length of pedagogical work (0,18).

In the group of low-skilled teachers factor 1 has an informative content of 28.5%. It most closely reflects the indicators 4 and 5, respectively: pedagogical abilities (0,8), attitude to work (0,75). The leading indicator here is pedagogical abilities, which is positively related to the fifth indicator. The teachers' abilities stimulate their attitude to the educational work with the students. It should be noted that the level of formed pedagogical skills manifests itself in this factor in the minimum value (0,06). Thus, one can assume that the abilities of the low-skilled teachers have a very small influence on the development of pedagogical skills. This factor is interpreted as pedagogical abilities.

The second factor, found in the group of highly-skilled teachers, has an informative content of 22.5%. It defines one indicator with the highest factor weight – the duration of pedagogical work with student groups (0.95), being an independent factor. The duration of work with student groups makes a significant influence on the level of pedagogical skills. We call this factor a time factor that promotes the development of skills in highly-skilled teachers (0,23).

In the group of low-skilled teachers, the second factor (its informative content is 28%) summarizes the following characteristics – the level of formed skills (0.82) and length of teachers' pedagogical work (0.71). The formation of pedagogical skills occurs mainly in the process of pedagogical activities. For low-skilled teachers the length of pedagogical work is crucial in developing skills. This factor can be interpreted as activities one.

The third factor, obtained in the group of highly-skilled teachers (with informative content of 26%), was formed on the basis of two parameters: the length of pedagogical work (0.73) and teachers' attitude to their educational work (0.84). The latter parameter is paramount, and it is named as a factor of relations. Highly-skilled teachers' attitude to work have a higher quality and awareness along with increasing their pedagogical experience. In other words, a sense of obligation, conscientiousness, responsibility are formed gradually after the teachers' deep awareness of their pedagogical tasks, as well as understanding the peculiarities of working with student youth and studying the specifics of

age groups of the students. This conclusion is in agreement with some results of N. V. Kuzmina's⁵ research.

The identified factor for the 2nd group (its informative content is 22%) includes basically such an indicator as the duration of pedagogical work with student groups (0.78). With smaller correlation coefficients, the following parameters are attached to this factor: the length of pedagogical work (0.5), and attitude to work (0.35). The analyzed factor can be interpreted as time factor. The duration of work with student groups has a positive effect on gaining experience in pedagogical activities and on the attitude of low-skilled teachers to their educational work with the students.

So, we received three factors in highly-skilled teachers group with about the same in formativeness. The leading factor here is the abilities factor, which combines the personality qualities of the teachers, their pedagogical abilities, the system of knowledge and skills used in educational work with the student youth. This factor is the main content characteristic of the studied structure.

The second factor was interpreted as time factor since the duration of work with the student groups allows the teachers to get to know the students deeply and comprehensively and, on this basis, improve their pedagogical skills. The identified factor is clearly manifested in the group of low-skilled teachers.

The third component is interpreted as a factor of attitude enriched by the experience of pedagogical activities (stemming from the length of teachers' pedagogical work) and comprising a coherent system of purposeful, conscious teacher's relationships with student groups and surrounding reality. Consequently, the pedagogical abilities, duration of work with student groups, and attitude to educational activities are the main factors in the structure of the process of improving pedagogical skills by the teachers of group I.

Graphic interpretation

The factoring of the studied indicators in the group of low-skilled teachers enables to differentiate three factors with also approximately the same informative content. Pedagogical abilities factor was of paramount importance being related to the parameter characterizing the teacher's attitude to pedagogical work with their students. This factor is slightly correlated with the indicator concerning the degree of the development of pedagogical skills. We assume that in the process of mastering the pedagogical skills the teachers of the second group more often put their

⁵ Kuzmina, N.V., Rean, A.A. (1993) *Professionalizm pedagogicheskoy deyatelnosti: Metod. Posobie [Professionalism of pedagogical activity]*. Sankt-Peterburg. 54 s. [in Russian]

hopes on their pedagogical abilities and therefore insufficiently developed the necessary skills in educational activities.

The second factor can be called the activity factor. It characterizes the degree of pedagogical skills development in the teachers, depending on the gained pedagogical experience.

The third factor is time. It once more expresses the fact that mastering the skills by the teachers of group 2 is highly dependent on the duration of time they work with the class, thus stemming from considerable pedagogical experience in this field.

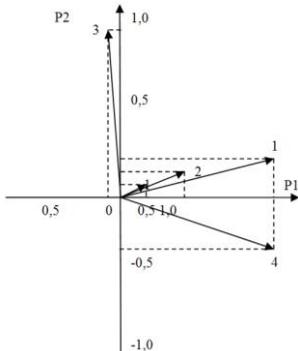


Fig. 1.

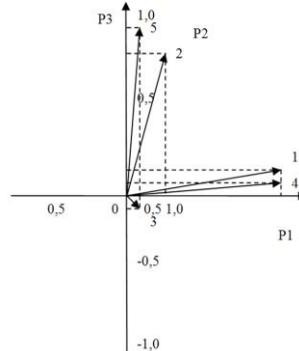


Fig. 2.

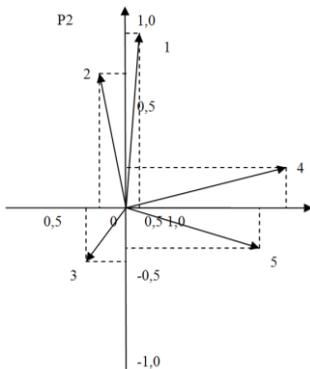


Fig. 3.

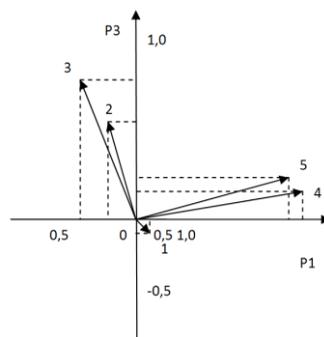


Fig. 4.

CONCLUSIONS

Thus, the comparison of the selected factors makes it possible to ascertain that the factor structure of the highly-skilled teachers is richer and more diverse than the factor structure of the low-skilled teachers. In the first case, the obtained factors are more complex, deep, and are

characterized by permeable indicators. Common to the two groups is the decisive role of the time factor, which makes it possible to gradually improve the teachers' pedagogical skills. The factor structure of low-skilled teachers is impoverished. The process of their reaching the pinnacles of pedagogical profession is determined mainly by the level of development of teachers' pedagogical abilities and pedagogical experience, obtained due to durable pedagogical work. The same conclusion was made concerning the geometric interpretation of the initial data (Figs. 1, 2). For highly-skilled teachers, a number of vectors based on factor weights in the first and second cases have a common orientation – a trend for integrity. Most vectors contain selected factors and therefore have sufficient quantitative indicators. Graphic representation allows one to have the idea of the peculiarities of the factor structure of the highly-skilled teachers, which is characterized, on the one hand, by a sufficiently high level of integration of the detected factors and, at the same time, by their considerable independence. This, perhaps, can be explained by a high efficiency of pedagogical activities of the highly-skilled teachers in the work with the student youth (Figs. 1, 2). For the low-skilled teachers (Figs. 3, 4), there is an inverse tendency: the factor structure is characterized by a low level of integration, the separation of its individual components; the vectors are oriented in different directions, that makes it impossible to speak of its integrity. This may, perhaps, explain the situation that most low-skilled educators cannot reach the pinnacle of pedagogical professionalism.

Prospective directions of further researches can be: constant updating the scientific knowledge about domestic and foreign educational systems; development of innovative models of teachers' educational professional competence in the work with the student youth; modernization of forms, methods, technologies of teachers' educational activities, enriching educational and methodological support of the educational process in the institutions of secondary and higher education, with taking into account the European integration processes; development of the system of professional training of a new generation of the teachers for educational activities in current conditions.

SUMMARY

The research deals with the problem of reaching high level of professionalism by the teachers engaged in educational work in the context of educational changes, stemming from leading European and national documents on education. The results of the study of factor structure of teachers' high level of professionalism in the educational work with student youth are analyzed. It was found that contemporary category of student youth is of great scientific interest for the researchers because the students reflect an important social phenomenon due to current social situation of their development. Due to the results of the pedagogical

experiment with use of the method of factor analysis a holistic integral picture was obtained concerning the peculiarities of teachers' educational activities, depending on the level of their pedagogical professionalism. The comparison of selected factors makes it possible to verify that the factor structure of the high-skilled teachers is richer and more diverse comparing with the structure of the low-skilled teachers. Among the high-skilled teachers the obtained factors according to outlined indicators differ in complexity, depth, and permeability. Common for the two groups of teachers is the decisive role of time factor, due to which it is possible to gradually improve the teachers' pedagogical skills. The factor structure of the low-skilled teachers is impoverished. It was revealed that the process of developing the teachers' professionalism in educational work is determined mainly by the level of development of teachers' pedagogical abilities and pedagogical experience depending on the duration of their work in educational establishments. This conclusion is confirmed by geometric interpretation of the received data. For the teachers who are characterized by high level of pedagogical professionalism (for high-skilled teachers) a number of vectors based on factor weights have a common orientation and are characterized by integrity and systematic organization of their activities. The results of the study could help to increase the level of teachers' pedagogical skills and abilities.

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